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**A Study of Short-term Variations in
Jupiter's Synchrotron Emission**

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Earth-based observations of the flux density and polarization of Jupiter's microwave emission provide useful data to test and constrain computational models of synchrotron radio emission from the inner regions of the Jovian magnetosphere. Stimulated by the sudden brightening of the synchrotron emission caused by the impacts of comet Shoemaker-Levy 9 in 1994, the observational techniques of the NASA-JPL Jupiter Patrol were modified to search for other short-term variations unrelated to the SL-9 event. The characteristics of the improved data base are described and the results of the search for variability on timescales of 5 to 100 days are reported. The first results of Jupiter observations from the Goldstone-Apple Valley Radio Telescope (GAVRT) project are reported and included in the data base. GAVRT is a new project in science education that engages middle- and high school students in science research.

The paper also includes new observations of Jupiter's rotational beamed emission, commonly known as the "beaming curve", that describes the observed flux density as a function of System III longitude. The shape of the "beaming curve" is known to change with the parameter D_E , the declination of the earth relative to Jupiter's rotational equator. While the history of Jupiter's beaming curve exhibits remarkable stability and repeatability as a function of D_E , there may be evidence for short term departures from the nominal curves. Data supporting this tentative conclusion are presented. Preliminary results of a study comparing the observations and computer simulations of the synchrotron beaming curve will also be presented and discussed (see companion paper, "Modeling Jupiter's Synchrotron Emission", by Bolton et. al.).

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